CAMPUS DEVELOPMENT GUIDELINES

Alberta

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ALBERTA ADVANCED EDUCATION
Campus Development Services

INTRODUCTION

Campus Development Services is a branch of the Administrative Services Division of Alberta Advanced Education. The branch's major role is to provide for the capital needs of all institutions, agencies and service units within the department's purview. In this role, it is responsible for compiling capital budget information, obtaining funding, distributing capital grants, monitoring expenditures and coordinating the planning, construction, acquisition and disposal of all capital assets.

The guidelines described in this document have been developed by the staff of Campus Development Services. They are based on work over a 12-year period with the institutions and other government departments and agencies.

I. BUDGETING GUIDELINES

A. Introduction

The annual capital budgeting process begins in March, more than a year preceding the budget year. Campus Development Services (CDS) representatives initiate the process by holding meetings with institutional administrators to assist with budget preparations. Official submissions are forwarded to CDS before May 31. By early June, all institutional requests are compiled into a departmental budget by CDS. The approval process is put into motion and approved grants are announced at the beginning of government's fiscal year, after the provincial budget has been tabled in the legislature.

New capital projects are considered as individual line items in the "B" budget category. Institutions are asked to submit these to CDS in order of priority.

The "A" budget category includes cash flows for previously committed projects, emergency items dealing with health and safety, and formula funding which provides for ongoing major maintenance of all capital assets. The three elements of formula funding are: furnishings and equipment (replacement and upgrading); renovations; and site and utility maintenance (replacement and upgrading). For provincially administered institutions, only the furnishings and equipment category is funded through Advanced Education. Building and site-related items are funded through Public Works, Supply and Services.

B. Formula Funding

1. Furnishings and Equipment - Replacement and Upgrading

This portion of the grant annually allows institutions to replace and upgrade worn or outdated equipment and furnishings. Useful life and value of equipment are used as the basis for calculating the required funding level. Although studies have shown that funding should be based on replacement values of inventories, due to economic restraint the budget requests are based on a percentage of book value inventories of furnishings and equipment. The book value, or purchase price, should include costs of delivery and installation. For colleges, technical institutes and vocational centres, 15 percent of book value is recommended and the inventory is reported as at June 30, one year preceding the budget year. For universities, 10 percent of book value is recommended and the inventory is reported from March 31, one year preceding the budget year. The inventory figures from all provincially administered institutions include all furnishings and equipment since all income that the provincially administered institutions generate goes directly into provincial revenue. Inventory figures for board-governed institutions include all furnishings and equipment except those in:

- Residences and residence-related food services
- Provincial labs
- Parking structures
- Utility plants.

Only active inventories are considered. Items which have been disposed of or are no longer being used for teaching purposes must be deleted from budget inventories. Equipment originally purchased from sources other than formula funding (e.g. research equipment or equipment for new programs) is included in the inventory only if it can be considered a teaching tool.

Note: For definitions of furnishings and equipment, refer to Section IV, Inventory Guidelines.

2. Renovations

The renovations portion of the formula funding grant allows institutions to carry out regular renovations and repairs to existing buildings. Research has shown that post-secondary institutions should annually set aside between 1 percent and 1.5 percent of the current building replacement value. During some years only minor renovations might be carried out. Sinking fund mechanisms should be established for such major items as roof replacement, boiler replacement, and electrical re-wiring.

The following example is a typical instructional building cost breakdown. Building component percentages are relative values expressed in relationship to the cost of the building.

Components	Percentages
Foundation	6.6
Superstructure	16.8
Exterior skin	9.6
Roofing	0.8
Interior finishes	15.6
Elevators	0.9
Electrical	12.0
Plumbing	7.0
H.V.A.C.	16.1
Fixed Equipment	5.6
Other (General)	9.0
	100.0

Only the foundation, superstructure and exterior skin have an almost indefinite life with proper maintenance. They represent one-third of the total building cost. The other items have a finite life, and represent two-thirds of the total building cost.

Percentage replacement values are calculated using a building life of 100 years. During this period a building will likely undergo two complete replacements. One of these will occur due to functional changes resulting from changing academic needs while the other will be the result of complete renovation or remodelling due to limited lives of components. To fund building repairs and renovations, the following allocation must be set aside every year:

$$\text{Annual Allowance} = \frac{2}{3}\left[\begin{array}{l}\text{of building}\\ \text{to be}\\ \text{remodelled}\end{array}\right] \times \frac{2 \text{ (times)}}{100 \text{ (years)}} = 1.33\% \text{ of current replacement value}$$

If this allowance is not set aside annually, our experience has been that larger amounts will be required in the future for building repairs and renovations.

In some cases buildings are allowed to deteriorate to the point where a decision to restore or replace must be made. We use the rule of thumb that if the cost of renovation exceeds two-thirds of the cost of replacement, then the building should be replaced.

The grant is calculated on a dollar amount per gross square metre of space (e.g. \$10.00 per m^2). The cost of average college and institute space appears to be approximately 90 percent of the cost of average university space.

Areas are calculated as at September 30 preceding the budget year for all institutions except universities, which use March 31, one year preceding the budget year.

For budget purposes, area calculations are modified to allow for the age of the building and its ownership status. The following factors are used:

Owned buildings 0 to 10 years old	1.0 x Area
Owned buildings 11 to 20 years old	1.1 x Area
Owned buildings 21 years or older	1.2 x Area
Leases less than 1 year	0 x Area
Leases 1 to 3 years	0.5 x Area
Leases greater than 3 years	0.75 x Area

When a building is restored its budget age becomes zero.

Types of space <u>included</u> in area calculations:

Instructional and ancillary space
Food service facilities (not related to residences)
Heated walkway enclosures
Heated farm buildings
Heating and cooling plants
Research stations - universities only (minus residences, garages, open storage huts, and shelters)

Types of space <u>excluded</u> in area calculations:

Residences and residence related food services
Students Union space owned and operated by students
Unheated storage buildings, open storage animal shelters
Parking structures
Unfinished areas in new buildings
Utility rooms and buildings
Faculty Clubs

Labor costs which are already covered by the institution's operating budget are not to be funded from this budget element.

3. <u>Site and Utility Maintenance - Replacement and Upgrading</u>

The site and utility portion of the formula funding grant permits the institutions to keep in good repair all site improvements which are outside the walls of instructional buildings. The grant is not to be used for day-to-day maintenance like grass cutting or minor repairs since these are operational expenditures. The grant is based on a percentage of current replacement values of improvements. Replacement values are calculated as at one year preceding the budget year.

Studies have indicated that the following formula funding levels are most desirable:

Surface improvements	2.0%
Mechanical systems	3.5%
Electrical systems	4.2%

Due to economic conditions, formula funding levels granted in recent years have been approximately half of the desirable level:

Surface improvements	1.0%
Mechanical systems	1.8%
Electrical systems	2.1%

Site and utility maintenance inventories include the following:

- Roads - paved
- Roads - gravelled
- Parking - asphalt
- Walks - concrete
- Curbing
- Signs - traffic
- Signs - buildings (not attached to buildings)
- Signs - entry
- Plantbeds, shrubs, trees
- Grass (sparse) rough
- Grass - turf
- Fences - 4' chain link
- Fences - watchman 6' chain link
- Fences - farm 4' woodpost
- Fences - wood 3'
- Fences - wood 6'
- Furnishings - kiosks
- Furnishings - bike racks
- Furnishings - benches
- Furnishings - bollards
- Furnishings - garbage cans
- Furnishings - woodsheds
- Furnishings - sandboxes
- Irrigation pipe
- Sprinklers
- Watermeters
- Exterior lighting - street
- Exterior lighting - athletic fields
- Athletic fac. - grass
- Athletic fac. - tennis court
- Athletic fac. - handball court (outdoors)
- Gravel areas
- Retaining walls
- Playground kindergarten
- Precast curbs
- Granite sets
- Brick-paved surfaces
- Plug-in rails
- Windbreaks
- Concrete planters
- Paraplegic ramps
- Bus shelters - unheated
- Works of art (not attached to building--at original cost)
- Building steps (outside of renovation formula)
- Information kiosks (not parking)
- Areas around residences and parkades
- Unheated storage and farm buildings
- Central utility plants (building and equipment)
- All utilities outside buildings
- Equipment in utility rooms inside buildings
- Electrical distribution system up to and including the main transformer for a building

Inventories exclude utilities inside buildings.

NOTE:

Each institution is to supply CDS with an accounting of formula funding expenditures following the end of the budget year.

C. "B" Budget Items

The "B" budget includes all new items. These items can deal with new construction, renovations, site development, furnishings and equipment. All costs associated with the item are to be included in the "B" budget request. Equipment costs, for example, are to include delivery and installation. New building requests are to include furnishings and equipment, related site work, all fees, and annual operating and maintenance costs.

II. SPACE GUIDELINES

A. Introduction

Institutional capacities are related to three main elements: available space, types of programs being delivered, and space with respect to time and occupancy. Guidelines have been derived from standards used throughout North America and empirical data derived from 12 years of experience with Alberta's post-secondary institutions. All assumptions noted must be kept in mind while tabulating space values per student.

B. Recommended Gross Areas

Universities	25.0m^2/student
Colleges (non-technical)	14.5m^2/student
Technical Institutes	21.0m^2/student
Agricultural Colleges	29.0m^2/student
Fine and Performing Arts Centres	39.0m^2/student

C. General Assumptions (system-wide)

Learning Resources Centre

- Stack area (0.01m^2/volume, 50 volumes/student)	0.50m^2
- Periodicals, etc. (25% of stack area)	0.12m^2
- Reading Stations (provide for 15% of enrolment at 2.2m^2/station)	0.33m^2
- Office space	0.05m^2
- Audio-visual and duplicating	0.25m^2
	1.25 net m^2/student

Office Space (including administration)

- Provide 13.0 net m^2/administrator and 13.0 net m^2/instructor using a students:instructor ratio of 15:1.
- Or, use an empirical value of 1.0 net m^2/student.

Auditorium (large lecture space)

- Use an empirical value of 0.2 net m^2/student.

Athletic Facilities

Gymnasium	0.70 net m^2
Exercise room	0.08 net m^2
Dressing room and showers	0.13 net m^2
Equipment storage	0.06 net m^2
Offices	0.03 net m^2
	1.00 net m^2/student

Food Services

- Assume 2.70 net m^2/meal served.
- Expect three 40-minute shifts.
- Also expect one-third of the students will use dining facilities.
- Add 0.1m^2/student for common areas.
- Calculation: (2.70 x 1/3 x 1/3) + 0.1 = 0.4 net m^2/student.

Guidance and Counselling

- Use an empirical value of 0.1 net m^2/student.

Student Activities

Crafts and hobby room	0.07 net m^2
Lounge (large area)	0.08 net m^2
Private space (cards, chess)	0.05 net m^2
Games room	0.22 net m^2
Stores (retail)	0.06 net m^2
Student Association	0.12 net m^2
	0.60 net m^2/student

D. **Specific Assumptions**

Universities

- Average student load is 30 hours per week; 15 classrooms and 15 labs.
- Average classroom and lab utilization is 30 hours per week based on two-thirds of a scheduled 45 hour week.
- Average classroom and lab has 70 percent of available stations occupied.
- Average classroom space is 1.7 net m^2/student.
- Average lab space is 10.0 net m^2/student.
- Research space is 10 percent of instructional space.

Colleges (non-technical)

- Average student load is 26 hours per week; 18 classrooms and eight labs.
- Average classroom and lab utilization is 31.5 hours per week based on 70 percent of a scheduled 45 hour week.
- Average classroom and lab has 70 percent of available stations occupied.
- Average classroom space is 1.7 net m^2/student.
- Average lab space is 6.5 net m^2/student.

Technical Institutes

- Average student load is 30 hours per week; 16 classrooms and 14 labs (shops).
- Average classroom and lab utilization is 31.5 hours per week based on 70 percent of a scheduled 45 hour week.
- Average classroom and lab has 70 percent of available stations occupied.
- Average classroom space is 2.0 net m^2/student.
- Average lab space is 9.3 net m^2/student.

Agriculturally-oriented Colleges

- Average student load is 30 hours per week; 16 classrooms and 14 labs.
- Average classroom and lab utilization is 30 hours per week based on two-thirds of a scheduled 45 hour week.
- Average classroom and lab has 70 percent of available stations occupied.
- Average classroom space is 2.0 net m^2/student.
- Average lab space is 9.3 net m^2/student.
- Farm facilities are 35 percent of instructional space.

Fine and Performing Arts Centres

- Assume that the 1984 space situation at the Banff Centre and the Alberta College of Art is acceptable. Both had approximately 39 gross m^2/student.

Allowance for Trades Space

- If an institution is purely non-technical, use 14.5 gross m^2/student.
- If an institution has 25 percent trades space, use 21.0 gross m^2/student.
- Other combinations should vary proportionally with the amount of trades space.

E. Space Calculations

Instructional and Related Space[1]

1. Classrooms - use Fenske Formula[2].
2. Labs (Shops) - use Fenske Formula[2].
3. Learning Resource Centre - see Assumptions.
4. Office Space - see Assumptions.
5. Auditorium - see Assumptions.
6. Athletic Facilities - see Assumptions.
7. Food Services - see Assumptions.
8. Guidance and Counselling - see Assumptions.
9. Student Activities - see Assumptions.

Minimum Net Assignable Area	(65% of subtotal)	net m^2
+ Other[3]	(35% of subtotal)	net m^2
Subtotal		gross m^2
+ Flexibility Factor (15% of subtotal)		gross m^2
Total gross area		gross m^2

NOTES: 1. Residences and parkades are excluded.

2. Fenske Formula: $S = \frac{(X)(ASF)(N)}{(U)(O)}$

S = Square metres
X = No. of students
ASF = Area per station
N = Average student hours/week
U = Room utilization hours/week
O = Room Occupancy

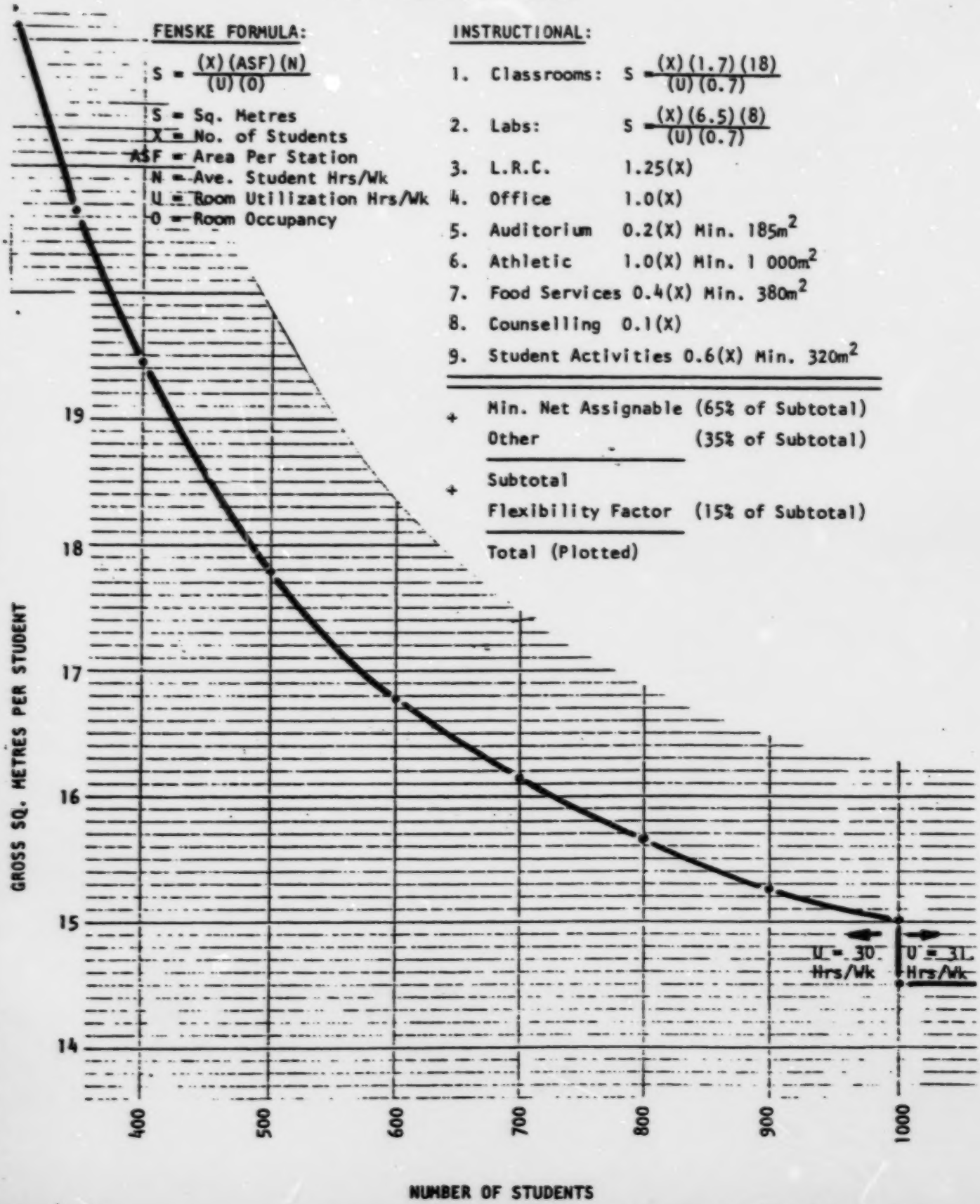
3. "Other" includes such items as custodial space, circulation, structural, mechanical, storage, receiving.

F. Graphic Examples

Although the following examples show a smooth exponential-type curve, local conditions may cause small institutions to deviate considerably from that curve.

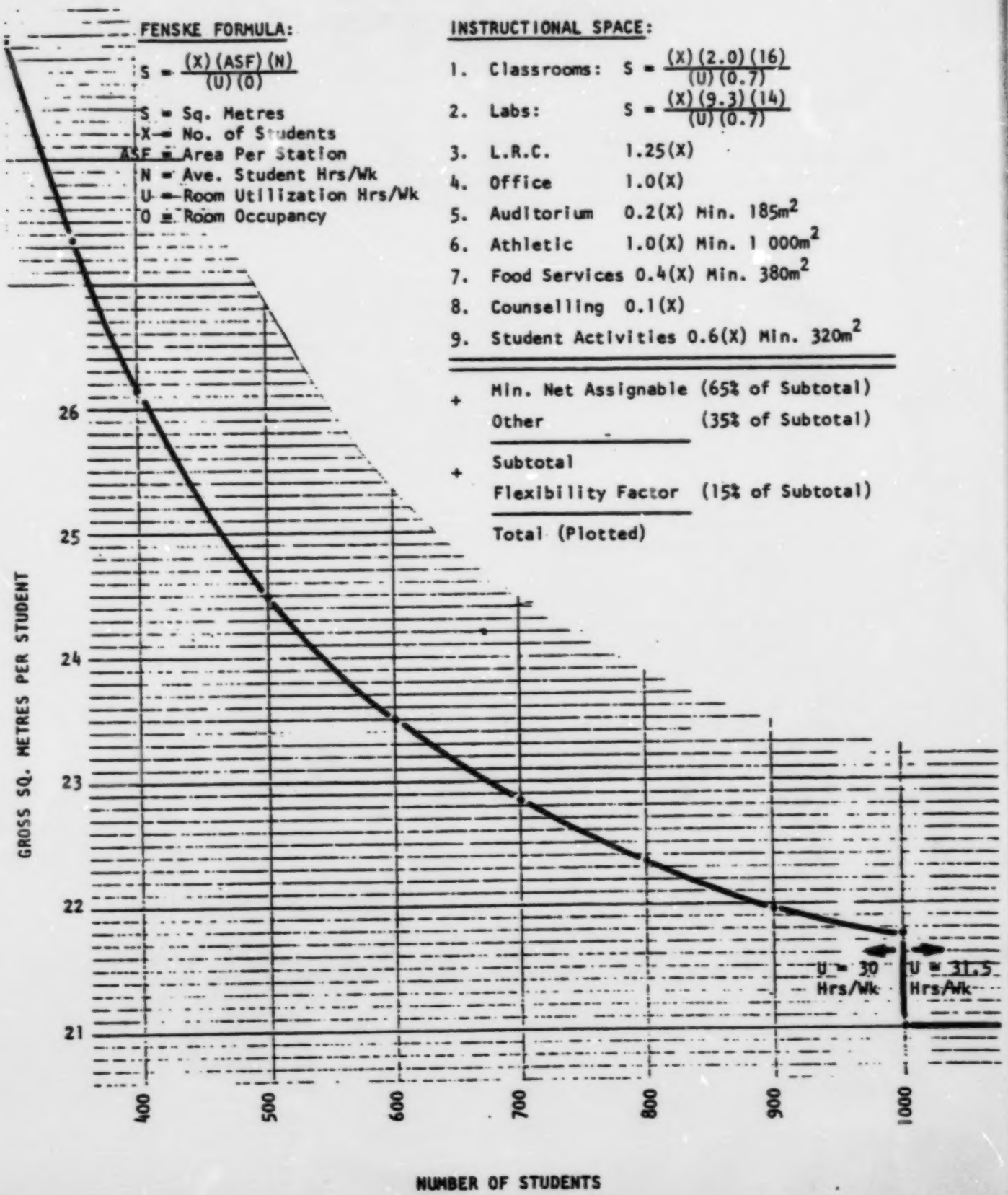
A GRAPHIC PLOT OF GROSS AREAS PER STUDENT

- For a lecture-oriented institution
(e.g. a Community College)



A GRAPHIC PLOT OF GROSS AREAS PER STUDENT

- For a lab/shop-oriented institution
(e.g. a Technical Institute)



III. BUILDING AND SITE GUIDELINES

A. Introduction

Building and site guidelines describe design criteria for institutional buildings and sitework funded by Advanced Education. The general design criteria are applied in the review of design concepts as well as more specific requirements or recommendations for construction details.

B. General Design Criteria

General design criteria are based on function and form, two important aspects of any design solution. Function relates to the building's working well in all of its parts. Form relates to a high quality interior and exterior appearance, essential to the success of any design scheme.

1. Function

Building functions are categorized according to function characteristics. Instructional and related space is separated into nine function components. They are:

- Classrooms
- Laboratories
- Learning Resource Centre
- Office Space
- Auditorium
- Athletic Space
- Food Services
- Guidance and Counselling
- Student Activities.

All functions must be accommodated in a building plan so each component works well without interference from other components. For example, the classroom component should not be located where activities from the athletic component adversely affect instruction. Also, paths of circulation through corridors and rooms should allow for a smooth flow of people without disrupting adjacent functions.

2. Form

Form, one of the architectural criteria, examines the design solution's appropriateness in relation to existing buildings and site. The architectural mass of any building addition to a campus should complement or enhance existing buildings. The color and scale should be consistent with the existing surroundings. These criteria also apply to sitework.

The choice of exterior building material should match or provide harmonious contrast with existing building exteriors. If the existing material is brick, the new material should be identical or similar in color and texture to the original material. If metal siding is the new material selected for the building exterior, the color should match the existing brick.

The scale of a campus is established by existing buildings. New additions should respect the existing scale by continuing with similar height components and building elements such as windows. Contrast in the form of a new addition would not be ruled out. Each solution would be assessed on its own merit.

Both the exterior and interior designs should be architecturally interesting. The proportions of windows and doors in the exterior facade may add elegance and refinement. The shapes of roofs and building masses may create an air of dignity. The contrast from the narrow corridor to the open atrium would give a quality of drama to interior space.

C. Recommended Detailed Design Considerations

Recommended detailed design considerations include access for the physically handicapped, energy conservation, and stair safety.

1. Requirements for the Handicapped

Minimum building requirements for the physically handicapped are those specified in the Alberta Building Code in "Building Standards for the Handicapped 1980". This document is issued by the Associate Committee on the National Building Code, National Research Council of Canada, Ottawa.

Some examples of these minimum standards include the following:

- Ramp slope ratios should not exceed 1 in 12 (although the authority having jurisdiction may permit a maximum slope of 1 in 8).
- Ramp widths should be a minimum of 914 mm (three feet).
- Ramp surfaces should be non-skid.
- Handrails are required at least on one side of the ramp and must extend a minimum of 300 mm beyond both the top and bottom ramp space.
- The topmost button in an elevator must not exceed a maximum height of 1.52 m.

2. Energy Conservation

CDS encourages use of the energy conservation guidelines developed by Alberta Public Works, Supply and Services. These guidelines are contained in their annual publication, "Design Requirements for Buildings".

Some examples of energy guidelines include the following:

a. Building designs should conform to the Building Energy Performance Index, the maximum amount of energy to be used by a building in a year.

- A building with floor area over 5 000 gross m^2 and eight hours per day occupancy should consume maximum energy of:

  750 MJ/m^2/year.

- A building with floor area over 5 000 gross m^2 and 24 hours per day occupancy should consume maximum energy of:

  1 100 MJ/m^2/year.

- A building with floor area of 1 000 gross m^2 and eight hours per day occupancy should consume maximum energy of:

  1 000/MJ/m^2/year.

- A building with floor area of 1 000 gross m^2 and 24 hours per day occupancy should consume maximum energy of:

  1 500/MJ/m^2/year.

- For buildings with floor area between 1 001 m^2 and 5 000 m^2, maximum energy consumptions are interpolated between those values for 1 000 m^2 and for over 5 000 m^2.

b. A computer analysis of energy consumption should be provided by the consultant to demonstrate compliance with the Building Energy Performance Index.

3. Stair Safety

CDS encourages the use of stair safety criteria which have been developed by Jake Pauls of the National Research Council in Ottawa. His publication, "Stair Use and Design for Safety", includes detailed recommendations to improve stair safety.

Some examples of his recommendations include the following:

- Handrails should be continuous for the entire run of the stairway.
- Handrails should extend a minimum of 300 mm beyond the top and bottom riser of the stairway.
- Handrails should be graspable for the entire run of the stairway.
- Tread widths should be a minimum of 280 mm (11 inches), preferably 300 mm (12 inches). Risers should be no higher than 180 mm (seven inches) and not less than 125 mm (five inches) high.

IV. INVENTORY GUIDELINES

A. Introduction

Inventories are necessary for the efficient management of capital assets. Furnishings and equipment, site improvement and building inventories are required for formula funding. Land inventories are useful for planning and control. Since furnishings and equipment inventories are rather complicated they will receive a detailed analysis in this section.

Institutions are responsible for establishing and maintaining inventories. Since provincially administered institutions fall under the administrative structure of the Department of Advanced Education, they are more directly affected by departmental inventory policies and government directives. Board-governed institutions may set their own inventory policies, but their control and accounting procedures must conform to methods approved by the Alberta Auditor General. All institutional submissions to Campus Development Services for formula funding must be based on the same data criteria and definitions.

B. Definitions

1. Capital Furnishings and Equipment

Capital furnishings and equipment are relocatable items that are not integral parts of buildings and possess the following characteristics:

- Life expectancy of more than one year under normal use,
- Original unit or system cost of $500 or more,
- Identity which does not change with use,
- Unit or system nature which makes formal accountability practical,
- Usually repaired, not replaced, when damaged,
- Most units or systems are constructed of more than one substance or material.

2. Accountable Supplies

Items in this category are normally similar to capital equipment and represent a large inventory value, but are funded from operating budgets. Their relatively short life, nominal cost (usually less than $500), and large quantities make it practical to keep them on a separate inventory system or identified separately on the same inventory system as capital equipment.

This category includes "attractive" items which should be protected from pilferage.

In most instances, items which do not function independently in their proper or full capacity and which are components of other pieces of equipment shall be listed in the inventory as parts of the total piece of equipment.

Accountable supplies normally possess at least three of the following characteristics:

- Constructed of a single substance or material,
- Life expectancy of at least one year under normal use,
- Inexpensive items which cost more to repair than replace,
- Expensive items which cannot be repaired when broken, cracked or split and must be replaced (e.g. glass products),
- Items purchased in large quantities,
- Items which maintain their identity when incorporated into a more complex unit.

3. Consumable Supplies

Consumable supplies are funded from the operating budget. Some general characteristics include the following:

- Used in large volume,
- Consumed during use,
- Lose original shape or appearance with use,
- Lose identity if they become part of a more complex unit,
- Life expectancy of less than one year.

C. Further Guidelines

1. Equipment in Buildings

When a new building is completed, its furnishings and equipment are funded from the building project budget and not from formula funds. These are identified as a separate budget item in estimates for provincially administered institutions. Equipment for new programs is usually funded from other sources. Project budgets for furnishings and equipment are approved on the basis of estimates which are considered maximum expenditures. Actual grants are made on the basis of more accurate equipment requests as these become available.

Built-in furnishings and equipment as well as items specified in building codes are normally part of the building contract. Drapes and carpeting are also provided with the building in most cases.

2. Portable Buildings

Portable buildings, which are not permanently affixed to the land but are designed for moving, should be included in the furnishings and equipment inventory. Examples include: aluminum garden sheds, skid-mounted trailers, mobile homes, mobile classrooms, and mobile labs or shops.